CLAIMS

What is claimed is:

1. In a method of producing capsular polysaccharide from a pneumococcus by maintaining the pneumococcus in a growth medium, the improvement comprising maintaining a gas having a sub-atmospheric concentration of oxygen in contact with the growth medium.

2. The improvement of claim 1, wherein the gas has an oxygen concentration not greater than about 16%.

3. The improvement of claim 2, wherein the gas has an oxygen concentration not greater than about 0.1%.

4. The improvement of claim 1, wherein the pneumococcus is an organism of the genus *Streptococcus*.

5. The improvement of claim 4, wherein the pneumococcus is an organism of the species *Streptococcus pneumoniae*.

6. The improvement of claim 5, wherein the pneumococcus is a variant of the species *Streptococcus pneumoniae* selected from the group consisting of variants 6A, 6B, 18C, and 9V.

7. In a method of producing capsular polysaccharide from a pneumococcus by maintaining the pneumococcus in a growth medium, the improvement comprising maintaining a gas having a super-atmospheric concentration of carbon dioxide in contact with the growth medium.

8. The improvement of claim 7, wherein the gas has a carbon dioxide concentration of at least about 3%.

9. The improvement of claim 8, wherein the gas has a carbon dioxide concentration of at least about 10%.

10. The improvement of claim 7, wherein the gas has a sub-atmospheric concentration of oxygen.

11. A method of alleviating a pneumococcal infection in an animal, the method comprising maintaining the animal in contact with a gas having a super-atmospheric concentration of oxygen.

12. The method of claim 11, wherein the lungs of the animal are maintained in contact with the gas.

13. The method of claim 11, wherein the gas has an oxygen concentration of at least about 25%.

14. The method of claim 13, wherein the gas has an oxygen concentration of at least about 50%.

15. The method of claim 14, wherein the gas is substantially pure oxygen.

16. The method of claim 11, wherein the infection is selected from the group consisting of pneumonia, bacteremia, sepsis, and meningitis.

17. A method of making an immunogenic preparation for administration to an animal at risk for developing a pneumococcal infection, the method comprising

maintaining pneumococcal cells in a growth medium having an oxygen content lower than the same medium equilibrated at the same temperature with normal air; and

isolating capsular polysaccharide produced by the cells from the cells, whereby the isolated polysaccharide constitutes the immunogenic preparation.

18. In a method of producing capsular polysaccharide from a pneumococcus by maintaining the pneumococcus in a growth medium, the improvement comprising maintaining the carbon dioxide concentration of the growth medium at a level at least equal to the concentration of carbon dioxide in the same growth medium equilibrated at the same temperature with a gas comprising 5% carbon dioxide.

19. A method of producing pneumococcal polysaccharide, the method comprising maintaining pneumococcal cells in a growth medium having an oxygen content lower than the same medium equilibrated at the same temperature with normal air.

20. The method of claim 19, wherein the medium is substantially devoid of oxygen.

21. The method of claim 19, wherein the medium has a carbon dioxide content which is greater than the same medium equilibrated at the same temperature with normal air.

22. The method of claim 21, wherein the medium is saturated with carbon dioxide.

23. The method of claim 21, wherein the medium comprises a carbonate or bicarbonate salt.

24. A method of assessing whether a test compound is useful for alleviating a pneumococcal infection in an animal, the method comprising comparing

the degree of phosphorylation of CpsD in pneumococcal cells maintained in the presence of the test compound and

the degree of phosphorylation of CpsD in the same type of cells maintained in the absence of the test compound,

wherein if the degree of phosphorylation of CpsD in the cells maintained in the presence of the test compound is less than the degree of phosphorylation of CpsD in the cells maintained in the absence of the test compound, then the test compound is useful for alleviating the infection.

25. The method of claim 24, wherein the degree of phosphorylation of CpsD is assessed by assessing the number of phosphorylated tyrosine residues present in CpsD.

26. The method of claim 24, wherein the degree of phosphorylation of CpsD is assessed by assessing the fraction of CpsD having at least one phosphorylated tyrosine residue.